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Impacts of the Proposed Manufacturing Property Tax Credit on Michigan Capital Investment and Employment

Prepared by Ernst & Young LLP for the Michigan Manufacturers Association

Introduction and Summary

Ernst & Young (E&Y) was asked by the Michigan Manufacturers Association (MMA) to estimate the impact on Michigan investment and employment of the property tax credit for manufacturing personal property taxes proposed in HB 4476 and SB 296.

E&Y estimates that businesses will increase their investment in Michigan machinery, equipment and structures by $1.65 billion within five years in response to the new property tax credit.[1] Including both the direct increase in manufacturing jobs and the indirect and induced economic impacts on all industries from the statewide economic multiplier, the property tax credits are expected to generate 30,000 total new jobs by 2011. The increased investment and jobs are above and beyond the levels that are projected to occur in Michigan under current law in 2011. In addition, the simulations indicate that the job impact may grow by another 15 percent to 35,000 new jobs by 2015.

Our two-step approach to estimating the economic impacts of the property tax credit is to: 1) estimate the expected response of new capital investment in manufacturing to the reduction in the cost of capital in Michigan, and 2) translate the change in business investment into additional Michigan jobs throughout the economy.[2]

The estimation methodology and detailed results are discussed below.

Increased Capital Investment in Response to the Personal Property Tax Credit

The first step in estimating the economic impact of the property tax credit was to model the credit as a reduction in the cost of capital for Michigan's manufacturers. Based on the industry-by-industry distribution of the annual dollar amount of the proposed property tax credits ($272.8 million) provided by the Bureau of Tax and Economic Policy in the Michigan Department of Treasury, the REMI (Regional Economic Models, Inc.) model of the Michigan economy was used to estimate the percentage change in the cost of capital by industry. For all manufacturing

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[1] The new investment (capital stock) represents the cumulative annual investment in machinery, equipment, and business structures, net of accumulated economic depreciation, over the five-year period.

[2] The cost of capital is equivalent to the before-tax return a business must receive on new investments to cover all of the costs of using machinery, equipment and structures. The costs related to using capital include property and corporate income taxes, net interest and depreciation of the property used in the operation of the business.

industries, the property tax credit is equivalent to a 0.9 percent reduction in the cost of investing in new Michigan plant and equipment.[3]

Based on this reduction in the cost of investing in capital assets, Michigan non-residential business fixed investment resulting from the policy change was estimated using an empirically derived elasticity of capital investment to changes in the cost of capital.[4] The investment elasticity measures the percentage change in new capital investment for each one percent reduction in the cost of capital. The calculations use an elasticity estimate of 0.6; in other words, a ten percent decrease in the cost of capital in the manufacturing sector will increase the level of annual investment by 6 percent.

Applying the elasticity measure to the estimated annual reduction in the cost of capital, the additional annual capital investment approaches $400 million by 2011. As additional capital investment is added each year to the stock of machinery, equipment and structures, Michigan's capital stock rises over time, increasing employment, worker productivity, and personal income. After allowing for annual depreciation, Michigan's capital stock is expected to be approximately $1.65 billion higher after five years compared to the capital stock that would exist in the fifth year without the tax law change.[5]

Increased Direct Michigan Employment

The second step in estimating the economic impact of the property tax credit is to translate changes in the capital stock into changes in Michigan employment. In this step we use the ratio of expected new jobs to projected new capital investment. The expected number of new employees per dollar of new capital investment is based on project-specific information derived from E&Y's state-by-state database of capital investments by industry for 2004.[6] The database includes information on 3,670 manufacturing facilities announced or under construction in the

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[3] The estimated impacts do not include a proposed change in assessment procedures for commercial real rental property (or the elimination of a special credit for telecommunications personal property). The REMI model indicates that the reduction in capital costs will vary by industry; for example, the value is close to 1.0 for the auto industry.

[4] The concept of the responsiveness (elasticity) of capital investment to changes in the cost of capital is discussed in Harvey S. Rosen, *Public Finance*, 7th edition (2005), Chapter 17. The 0.6 elasticity estimate is supported by the summary of results from a number of empirical studies discussed in detail in Robert S. Chirinko, "Corporate Taxation, Capital Formation, and the Substitution Elasticity Between Labor and Capital," *National Tax Journal*, June 2002 (pp. 339-355). Table 1 in the article shows a general range of elasticity estimates from 0.2 to 1.0 depending upon the type of data and methodology used and time periods of analysis. Because the elasticity for a single state is expected to be higher than the measure nationally, we chose the 0.6 value as a reasonable estimate.

[5] The depreciation calculations assume that 17% of the net stock from the prior year is depreciated each year.

[6] E&Y has compiled and analyzed nearly 10,000 individual capital investment projects reported by third-party research firms and news publications, including Conway Data, F.W. Dodge/Portfolio and Property Research, and selected state departments of economic development. Projects that are included in the 2004 database were either announced or under construction during the year and involved capital investment in excess of $10 million or the creation or relocation of 20 or more jobs. Reported capital investment includes both real and personal property investment to expand existing facilities or to build and equip new facilities. The numbers of new jobs associated with the projects represents the increase in employment at individual facilities resulting from capital investments in those facilities.

United States in 2004. Based on these data, presented in Table 1, capital investments by manufacturing industries in Michigan created 4.5 new jobs for every $1 million of new investment.[7]

Table 1
Michigan Manufacturing Industry Capital Investments and Related Jobs, 2004

Project Industry	Capital Invest.	New Related Jobs
Food Manufacturing	$182.1	979
Textile Mills	2.0	21
Textile Product Mills	6.2	113
Leather and Allied Product Manufacturing	45.7	104
Wood Product Manufacturing	18.0	356
Printing and Related Support Activities	13.0	67
Chemical Manufacturing	400.8	388
Plastics and Rubber Products Manufacturing	123.8	1,822
Nonmetallic Mineral Product Manufacturing	7.4	72
Primary Metal Manufacturing	78.6	1,640
Fabricated Metal Product Manufacturing	122.8	879
Machinery Manufacturing	352.8	1,102
Computer and Electronic Product Manufacturing	76.9	1,002
Electrical Equipment, Appliance, and Components	63.8	235
Transportation Equipment Manufacturing	4,370.8	16,526
Furniture and Related Product Manufacturing	21.8	682
Miscellaneous Manufacturing	78.0	713
Total Manufacturing Projects	**$5,964.5**	**26,700**

Note: Prepared by Ernst & Young from data on announced capital investment projects exceeding $10 million of investment or 20 employees.

Combining the estimated increase in capital investment ($1.65 billion) with the jobs per $1 million in investment ratio (4.5), the property tax credit is expected to produce 7,400 new manufacturing jobs within five years. E&Y used the IMPLAN Michigan input-output economic model to determine the additional jobs created in the industries manufacturing, installing, and servicing the increased capital stock in Michigan.[8] The additional demand for capital assets (a bundle of commodities and services representing typical capital investments) was used to simulate the Michigan employment impact of producing and supporting the additional capital assets that will comprise the projected $1.65 billion increase in the capital stock.[9] This additional output adds 1,600 new direct Michigan jobs.

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[7] This ratio is also supported by 2003 Michigan data for manufacturing projects assisted under the MEGA economic development program. The job-investment ratio for these projects was 4.3.

[8] The IMPLAN model is produced by the Minnesota IMPLAN Group, Inc. and is used widely for economic impact analysis by both private- and public-sector analysts. The model estimates direct, indirect, and induced Michigan jobs related to the higher levels of direct manufacturing and capital producing industry employment.

[9] The additional Michigan economic activity in the industries producing capital goods represents both new investment and the investment needed over time to replace the portion of the higher capital stock that wears out each year. The annual flow of new investment approaches $350 million after five years.

Table 2 shows the estimated distribution of the 9,000 direct new jobs due to the proposed manufacturing property tax credit. The table shows that the direct manufacturing employment impacts are spread broadly across different manufacturing sectors. It is important to understand that the 9,000 jobs are additional jobs that will be supported by a stronger Michigan economy in five years due to the tax policy change. The estimate does not say that, compared to Michigan employment today, there will be 9,000 more direct jobs. For some industries, the total level of employment in five years may still be lower than employment today. However, whether industries are increasing or decreasing in total jobs compared to today, Table 2 indicates that the expected jobs will be higher than they otherwise would be in five years without the new property tax credit.

Table 2
Estimated Direct Job Impacts in Five Years

Industry	**Direct Jobs**
Motor Vehicles	2,946
Semiconductors and Related Devices	1,298
General Industrial Machinery	1,263
Chemical Preparations	869
Miscellaneous Manufacturing Industries	581
Paper Mills	444
Direct Jobs from Increased Capital Stock	7,400
Direct Jobs Related to Investment Activities	1,600
Total Ongoing Direct Jobs Impact	**9,000**

Note: Prepared by Ernst & Young

Total Increased Direct and Indirect Michigan Employment Impacts through 2011

The direct effect of the property tax credit will be 9,000 new jobs after five years. In addition, the direct jobs will create additional indirect jobs at suppliers to the manufacturing sector (in addition to new jobs in industries producing capital equipment already included in the direct estimates) and through additional statewide consumer spending from higher incomes due to more jobs and higher productivity. This is the multiplier effect that increases output and jobs throughout the economy. The industry multipliers, which determine the magnitude of this effect, were derived from the IMPLAN Michigan model.

As shown in Table 3, the 9,000 direct jobs (from Table 2) will generate 21,140 additional indirect and induced jobs for a total increase of 30,140 jobs.[10] Based on these results, the overall

[10] The IMPLAN model was used to estimate the indirect and induced impacts of 7,400 jobs in the manufacturing sector resulting from the sector's increased output and 1,600 jobs associated with the acquisition and ongoing maintenance of additional invested capital. To reflect the difference in the economic multiplier associated with each manufacturing industry, the 7,400 jobs were modeled as discrete employment changes in six industries based on each industry's share of the total property tax credit. The 1,600 additional jobs associated with the production and support of capital assets were distributed across 509 industries, based on each industry's share of national employment related to capital investment. The indirect and induced jobs, based on each industry's estimated direct

job multiplier for the tax policy change is a fairly conservative value of 3.35 (30,140 total new jobs divided by 9,000 direct new jobs).

Table 3
Total Direct, Indirect, and Induced Job Impacts from Increased New Direct Manufacturing and Capital Investment Jobs

Industry	Increased Manufacturing Output	Investment Related Activities	Total Additional Jobs
Agriculture	154	23	178
Mining	22	2	24
Construction	595	742	1,337
Manufacturing	10,692	908	11,600
TCPU	1,035	111	1,146
Trade	5,285	873	6,158
FIRE	1,168	181	1,349
Services	6,963	998	7,961
Government	210	26	236
Other	135	17	152
Total	**26,260**	**3,880**	**30,140**

Note: Prepared by Ernst & Young

Increased Employment after 2011

The impact models used to estimate the new Michigan investments and jobs in response to the property tax credits indicate that the capital stock may continue to grow beyond the first five years after the tax law change. While the time path for new investment cannot be predicted with certainty, the simulations indicate that the job impact may grow by another 15 percent to 35,000 new jobs by 2015.

job impact and industry-specific multipliers, were then summed and compared to the total direct job impact to derive the overall employment multiplier.